

Hierarchical spline spaces suited for adaptive methods analysis

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We introduce a type of hierarchical spline spaces that is well suited to the theoretical treatment of adaptive isogeometric methods.

More precisely, we provide a procedure to select B-splines of different levels that will form a basis (using only a graph structure that can be given to the B-splines of different levels). We provide a refinement procedure that guaranties a control on the gap of the basis functions and a bound on the complexity, i.e. the dimension of the space is uniformly bounded by the history of the marked functions.

With these properties of the space we introduce an a posteriori error estimate for the Laplace equation and prove the convergence and optimality of the adaptive method thus defined.